

DOCUMENT RESUME

ED 170 503

CE 020 224

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TITLE Project Equality. Highline Public Schools, Seattle, Washington. A Submission to the Joint Dissemination Review Panel.
INSTITUTION American Institutes for Research in the Behavioral Sciences, Palo Alto, Calif.
SPONS AGENCY Office of Career Education (CHEW/OE), Washington, D.C.
REPORT NO AIR-66700-4/78-TR1(9)
PUB DATE 30 Apr 78
CONTRACT 300-77-0303
NOTE 12p.; For related document see ED 162 106 and CE 020 214-215

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Career Education; Educational Finance; Educational Objectives; Elementary Education; *Evaluation Methods; Instructional Materials; Learning Activities; Program Costs; *Program Effectiveness; Program Evaluation; Sex Role; *Sex Stereotypes; Validated Programs
IDENTIFIERS *Project Equality

ABSTRACT

One of seven career education programs chosen for nationwide dissemination by the Department of Health, Education, and Welfare's Joint Dissemination Review Panel (JDRP), a Project Equality is being conducted for grades K-6 in Seattle, Washington. For the years 1973-78, it received both federal and state funding. Intended to reduce sex-role stereotyping, the project developed three sets of materials: (1) five occupation simulation packets, (2) a book of short-term activities focusing on sex roles in the home and employment, and (3) a picture book showing males and females in non-stereotyped work settings. To evaluate the project's effectiveness, the "Who Should" test was administered in 1977-78 to K-6 students in two school districts on a pre- and post-test basis. Based on the gains shown by the test results, the project materials were judged to be highly effective. Since the post-test was given after the short time of two to three weeks and after only one set of materials was used, it was concluded that the use of additional materials over a longer time would probably increase the impact even further. (The review process that this and the other six programs underwent prior to JDRP submission and approval is described in CE 020 214-215.) (ELG)

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PROJECT EQUALITY
Highline Public Schools
Seattle, Washington

A Submission to the
Joint Dissemination Review Panel

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American Institutes for Research

30 April 1978

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
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CE 020 224

PROGRAM AREA: CAREER EDUCATION

ACTIVITY TITLE, LOCATION: Project Equality, Highline Public Schools, Seattle, Washington

DEVELOPED BY: Highline Public Schools

SOURCE AND LEVEL OF FUNDING:

1973-74:	\$35,740	ESEA Title III
1974-75:	82,864	ESEA Title III
1975-76:	71,268	ESEA Title III
1976-77:	38,548	ESEA Title IVc
1977-78:	36,800	WEEA

BRIEF DESCRIPTION OF ACTIVITY:

The major thrust of Project Equality has been the reduction of sex-role stereotyping in students at the K-6 grade levels through implementation of materials which counter such stereotypes in both occupational and home sex roles. To accomplish this purpose, the staff of Project Equality have developed three sets of materials, which may be used independently or in combination.

Activity Description

Each set of materials is designed to provide students with nontraditional sex role models. The development of materials extended over the project's first three years of operation (1973-76), with final field testing taking place during the 1977-78 school year. The three sets of materials are:

1. Occupation Simulation Packets. This set of materials consists of five separate packets, each of which may be used alone. Two packets have been developed for use with grades K-2 students, two for students in grades 3-4, and one for students in grades 5-6. These packets are designed as a hands-on career education activity for elementary students based on the "isolated skill concept." This is the singling out of a saleable work skill required for a wide variety of jobs and already possessed, in some measure, by the student. The student identifies and uses the skill in a hands-on simulated work experience. As students apply their saleable skills in a variety of job-related activities, it becomes clear that: (1) a skill is not dependent on sex; and (2) a skill required for one type of work is often transferable to another type of work. Discussion questions for teacher use with the class also emphasize these two points. The packets include:

- Color Discrimination - This packet uses the skill of color discrimination, which is required in such occupations as interior decorator and electrician. Activities include sorting bundles of wire and socks by color. Time usage: 2-3 hours over a 2-3 week period. Grade levels: K-2.
- Crawling and Squatting - This packet uses the skills of crawling and squatting and demonstrates how they are needed in occupations such as plumber and stock clerk. Activities include stocking "grocery shelves" and crawling under "houses" to tighten pipes. Time usage 2½-3 hours over a 2-3 week period. Grade levels: K-2.
- Assembling - This packet uses the skill of assembling an item in a specific sequence. This skill is required in such occupations as factory worker and baker. Activities include assembling a ballpoint pen and a bicycle reflector. Time usage: 2-4 hours over a 3-week period. Grade levels: 3-4.
- Creativity - This packet uses the skill of creativity, which is required in such occupations as artist, weaver, and architect. Activities include making puppets and weaving wall hangings. Time usage: 8-10 hours over a 3-4 week period. Grade levels: 3-4.

- Measuring - This packet uses measuring skills found in different occupations, including shoe salesperson, pastry cook, and carpenter. Special attention is paid to avoiding sex stereotyping in cooking and sewing occupations. Activities include measuring a coat pattern and a wearer to determine if the coat would fit and measuring task accomplishment with a stopwatch. Time usage: 3-6 hours. Grade levels: 5-6.

Lesson plans and many required materials are included with the packets. The materials show great sensitivity to many kinds of discrimination: illustrations show a mix of races as well as sexes, and a discussion of how to deal with handicapped children is included in the Color Discrimination and Crawling and Squatting packets.

2. Yellow, Blue, and Red Book. This packet contains a large number of ideas for short-term activities which help the teacher and students to expand their awareness of sex-role stereotyping, and broaden their view of sex roles in the home and of appropriate job opportunities available for all qualified people. Time usage: 3-5 hours over a 3-week period. Grade levels: 1-6.

3. Many Thousand Words - Work Pictures. This looseleaf book contains a set of 8x10, black and white pictures of women and men, and girls and boys in a variety of non-stereotyped work settings at home, school, and in the community depicting various skills and abilities. Discussion questions focus on the skills needed and on whether persons of either sex might have those skills. Time usage: 5 hours over a 3-week period. Grade levels: 1-6.

Common Characteristics of Materials. All Project Equality materials have been designed to have the following characteristics:

- They provide content material which can expand students' perceptions of occupations open to females and to males.
- They fit within the context of subjects the teacher is already expected to cover in the classroom.
- They are self-contained.
- They are easily adapted to different classroom settings.
- They do not require any additional teaching or support staff members for implementation.

Measurement of Achievement. The Project Equality staff has also adapted the "Who Should" test, from work originally done by Dr. Lynne Iglitzin of the University of Washington. This test is used with all materials and attempts to measure changes in students' perceptions of occupational and home sex roles. It will be described in detail in the "Evidence of Effectiveness" section of this submission.

Goals and Objectives

The goal of Project Equality is to expand students' perceptions of occupations open to females and those open to males. The following objectives were developed to meet this goal:

Objective 1. Elementary students in grades K-6, where any one of five Occupation Simulation Packets is used appropriately, will have expanded their perceptions of job options open to females and males. By the conclusion of the treatment period, these students will score significantly higher than a control group of students drawn from the same grade levels on the "Who Should" test.

Objective 2. Elementary students in grades 1-6, where the Yellow, Blue, & Red Book is used appropriately, will have expanded their perceptions of job options

open to females and males. By the conclusion of the treatment period, these students will score significantly higher than a control group of students drawn from the same grade levels on the "Who Should" test.

Objective 3. Elementary students in grades 1-6, where Many Thousand Words - Work Pictures are used appropriately, will have expanded their perceptions of job options open to females and males. By the conclusion of the treatment period, these students will score significantly higher than a control group of students drawn from the same grade levels on the "Who Should" test.

In these objectives, the term "students" means those boys and girls who have both participated for the entire treatment period and also have taken both the pre- and posttests. Appropriate usage means usage for at least the number of hours suggested earlier for each packet or set of materials.

Claims of Effectiveness

All three sets of materials were field tested during the 1977-78 school year in two school districts in the Seattle area. The objectives listed above were met in a majority of cases, leading to the conclusion that students have expanded their occupational perceptions to include non-stereotyped jobs for both sexes.

Context

Background. Project Equality's home site was the Highline School District near Seattle, Washington. The impetus for the project was a study of 258 district fifth graders in 1971. The study demonstrated that both boys and girls tended to see jobs in terms of masculine and feminine stereotypes, and that occupational aspirations of the fifth grade girls fell heavily into feminine stereotyped roles. Staff of Project Equality set out to provide materials which were free of sex stereotyping and which demonstrated to students that people of both sexes could perform a wide variety of job tasks.

Field test materials. Project materials were developed and revised extensively during the first three years of project operation. Final field testing in 1977-78 was conducted outside the Highline District to assure that no student exposure to materials had taken place in earlier years. The results discussed in this submission are from two districts, the Northshore and Bellevue School Districts, also near Seattle. These two districts, as well as Highline School District, can be characterized as predominantly white middle-class, with 90% or higher white populations. Northshore School District covers an area which is rapidly evolving from a farm economy to an industrial/residential area. The Bellevue School District contains mainly middle and upper middle class families, with a high percentage (67%) of professional, technical, and managerial employment. Per-pupil expenditures in the Northshore School District were \$1,386 in 1976-77, while in the Bellevue School District they were \$1,587.

Intended Users and Beneficiaries

The intended users are K-6 students of both sexes and various socioeconomic and cultural backgrounds. The activities are simple, interesting, and experiential, making them usable with students of different ability levels.

Characteristics of Students Involved

Like the total populations of the school districts, the K-6 students with whom these materials have been used are primarily white and middle class. Achievement levels vary, however: latest figures from the annual statewide assessment of fourth grade achievement, using the Comprehensive Test of Basic Skills battery, show Northshore students scoring at the 58th percentile on the average, while Bellevue scored at the 69th percentile on the average. (Students in the Highline District, where materials were originally developed, scored at the 48th percentile.) Each student population was comprised of approximately equal numbers of boys and girls.

Salient Features

The most important features of these materials are summed up by the following points:

- The materials present simple, interesting, bias-free activities which demonstrate that work skills can be possessed by persons of both sexes.
- They are self-contained and can either be used individually or in combination over the K-6 grade range to provide students with a longer series of non-stereotyped activities and concepts.
- The materials are relatively low in cost and the program can easily be implemented within any K-6 curriculum.

Costs

Presently, Project Equality staff members train local district staffs to implement materials. It is suggested that adopting districts plan to involve the following personnel: the district career education director and/or curriculum director; an elementary principal; an elementary school librarian; and six elementary teachers. A district adopting all Project Equality materials should plan to assume costs for the following:

- A 1½-day training session for staff members implementing the materials
- Two ½-day followup meetings after the training session
- Adoption of Occupation Simulation Packets
- Adoption of the Yellow, Blue, and Red Book
- Adoption of the Many Thousand Words - Work Pictures
- Evaluator for field testing of materials (if desired)

Table 1
Approximate Costs for Adoption of Project Equality Materials

<u>Staff Development</u>	<u>First Year Implementation Costs</u>
District Implementation Team:	\$650.00
1 Career Education Director	
1 Elementary Principal	
1 Elementary Librarian Substitute	
6 Elementary Teachers at \$35/day	
<u>Materials</u>	
Occupation Simulation Packets:	
K/2 Crawling and Squatting	275.00
K/2 Color Discrimination	200.00
3/4 Assembling	180.00
3/4 Creativity	300.00
5/6 Measuring	365.00
Yellow, Blue, and Red Book	50.00
Many Thousand Works - Work Pictures	50.00
<u>Contracted Services</u>	
Evaluator for pilot testing of materials	200.00
2 days at \$100/day	
	<u>\$2270.00</u>

The estimated costs for operation in subsequent years (replacement of lost or damaged items) are \$75.00.

Per pupil costs. Since these materials could be used by all district elementary schools in turn, per pupil costs would depend on total number of district K-6 students. Assuming a district had 3,000 K-6 students, per pupil costs would be:

First year:	\$0.76
Subsequent years:	0.03

EVIDENCE OF EFFECTIVENESS

Interpretability of Measures

The "Who Should" test was the outcome measure for all sets of materials. There are two forms of this instrument: one for grade levels K-2, and the other for levels 3-6.

K-2 form. The K-2 form has 26 questions which are read to students by the teacher. The students have only the answer sheet, not the questions. Two sample questions are: "At home, who should wash dishes? Men? Women? Or both?" "Who can use a hammer better? Boys? Girls? Or both the same?" All questions are answered by the students by circling a picture of a boy, or of a girl, or of a boy and girl standing together.

3-6 form. The grades 3-6 form of the test has four parts with a total of 41 items. As in the K-2 form, teachers read the questions aloud to students. Part I lists 19 occupations such as carpenter and nurse; students circle "man," "woman," or "both" to indicate who should do the job. Part II lists six jobs done in class such as "eraser cleaner;" response options are the same as for Part I. Parts III and IV list jobs done in the home. Response alternatives to Part III are "father," "mother," or "both," and response alternatives to Part IV are "men," "women," or "both."

Reliability and validity. Experts on sex-role stereotyping at the elementary level reviewed the tests and confirmed their content validity. Test-retest reliability and item validity were assessed in a school district that had not been exposed to instrument and materials development activities and where women's rights were not formally included anywhere in the curriculum.

The test was administered twice to the same students two weeks apart. Most materials required about two weeks of usage, so two weeks corresponded to the interval between pre- and posttests for both treatment and control classes in this study. The test-retest correlations were .62 for the K-2 form (administered to 20 first grade students) and .88 for the 3-6 form (administered to 22 fourth grade students). Item validity was determined by computing biserial correlations between each item and the whole test score. The coefficients for the K-2 form ranged from .19 to .69 with an average of .52. For the 3-6 form they ranged from .41 to .73 with an average of .59. Minor modifications to the test were made on the basis of these data.

Credibility of Evidence

For the 1977-78 evaluation of student outcomes, all tests were administered by the students' classroom teachers. All teachers had received two days of training and followup consultation from the Project Equality staff on how to implement the materials and how to conduct the pre- and posttesting. During these sessions, teachers were instructed to read test directions and items slowly, to stay as close to the script as possible in order to keep instructions similar for all classrooms, and to use a neutral tone of voice. Teachers were told to repeat questions, if necessary, to allow students enough time to think over the questions before marking their answers.

The K-2 form was administered in two sittings during the same day. The 3-6 form was administered in one sitting. Scoring was done by project staff, with two persons independently scoring each test as a check on accuracy. Scores were key punched for computer analysis and all key punching was verified. Project staff members were also responsible for final analysis and interpretation of results.

Evidence of Impact

Evaluation design. The study to assess impact was conducted with K-6 students in the Northshore and Bellevue School Districts. The study was designed to provide pre- and posttest measures of performance on treatment and control students for each packet or set of materials. The rationale for this design assumed that real

student growth could be assumed to have occurred if the group mean pretest difference was not statistically significant and group mean posttest difference was statistically significant following use of any one set of materials with the treatment group.

In each district, treatment schools were selected from the middle range of average school-wide achievement scores within the district. For each treatment school, another district school was selected whose average achievement scores matched those of the treatment school as closely as possible. Because of practical constraints on evaluation in actual school settings, teachers in the selected treatment schools were asked to volunteer to use Project Equality materials in their classrooms. District field test coordinators selected teacher participants from among these volunteers, paying particular attention to achieving a mix of teachers which was representative of the whole district. Control school teachers were also volunteers and were selected on the same basis. The total number of teachers implementing Project Equality materials in the two districts was 37, while the number of control group teachers was 47.

Data analysis. The same outcome measure was used regardless of which materials were taught; therefore, the control students' scores at each grade level were combined into one group, whereas the treatment students' scores were separated according to the materials taught. This accounts for the much larger N's for the control than for the treatment groups. This was judged to pose no problem in analyzing the data, since variances of treatment and control groups were quite similar.

Only those students who took both the pretest and the posttest were included in the analyses. All students in a given grade level who were instructed in the same materials were combined and then compared with all control students at that grade level. For each comparison, a t-test of independent means was computed on pretest means of treatment and control groups and a separate t-test was computed on posttest means. Separate analyses were performed for each Occupation Simulation Packet, for the Yellow, Blue and Red Book, and for the Many Thousand Words - Work Pictures.

Results Data tables for each analysis are separately presented and explained below. The top of each table consists of a bar graph of the mean gain of each group at each grade level, together with a table of the means and standard deviations on the pre- and posttest. The bottom of each table shows the value of the t-test and the corresponding significance level for each comparison.

Occupation Simulation Packet: Color Discrimination (Table 2). The treatment and control groups started at almost the same point, as shown in Table 2. The treatment group significantly out-performed the control group on the posttest.

Table 2									
<u>Color Discrimination (26 items)</u>									
<u>Grade</u>			<u>Mean Gains</u>	<u>Pretest</u>		<u>Posttest</u>			
			Gain = 5.20	Mean	SD	Mean	SD		
2	T			12.39	4.35	17.59	4.66		
	C		Gain = .18	12.32	4.25	12.50	4.29		
			12 13 14 15 16 17 18						
			T = Treatment Group	C = Control Group					
t-tests									
<u>Grade</u>	<u>T</u>	<u>N</u>	<u>C</u>	<u>t</u>	<u>df</u>	<u>sig</u>	<u>t</u>	<u>df</u>	<u>sig</u>
2	41		156	.09	195	NS	6.32	195	<.0005

Occupation Simulation Packet: Crawling and Squatting (Table 3). The first grade treatment group scored close to the control group on the pretest but significantly above it on the posttest. In the second grade, the pretest difference was significantly in favor of the control group; yet the large gain in treatment group scores makes the posttest difference significant in favor of the treatment group. At the kindergarten level, the treatment group showed greater gains than the control group, but these were not significant.

Table 3
Crawling and Squatting (26 items)

Grade		Mean Gains	Pretest		Posttest	
			Mean	SD	Mean	SD
K	T	Gain = 2.05 	15.05	6.11	17.10	4.81
	C	Gain = 1.64 	14.80	5.62	16.44	5.52
1	T	Gain = 4.53 	13.07	3.94	17.60	4.18
	C	Gain = .24 	12.66	4.90	12.90	4.88
2	T	Gain = 6.63 	8.55	3.58	15.18	3.83
	C	Gain = .18 	12.32	4.25	12.50	4.29

8 9 10 11 12 13 14 15 16 17 18

T = Treatment Group C = Control Group

t-tests								
Grade	N		Pretest			Posttest		
	T	C	t	df	sig	t	df	sig
K	20	41	.15	51	NS	.48	59	NS
1	30	166	.50	194	NS	5.52	194	<.0005
2	11	156	3.33	165	<.005	2.22	165	<.025

Occupation Simulation Packet: Creativity (Table 4). The creativity activity was highly effective at both grades 3 and 4, as shown in Table 4. At neither grade were the pretest scores significantly different for treatment and control groups; however, following the treatment intervention, the treatment group far out-performed the control group at both grade levels.

Table 4
Creativity (41 items)

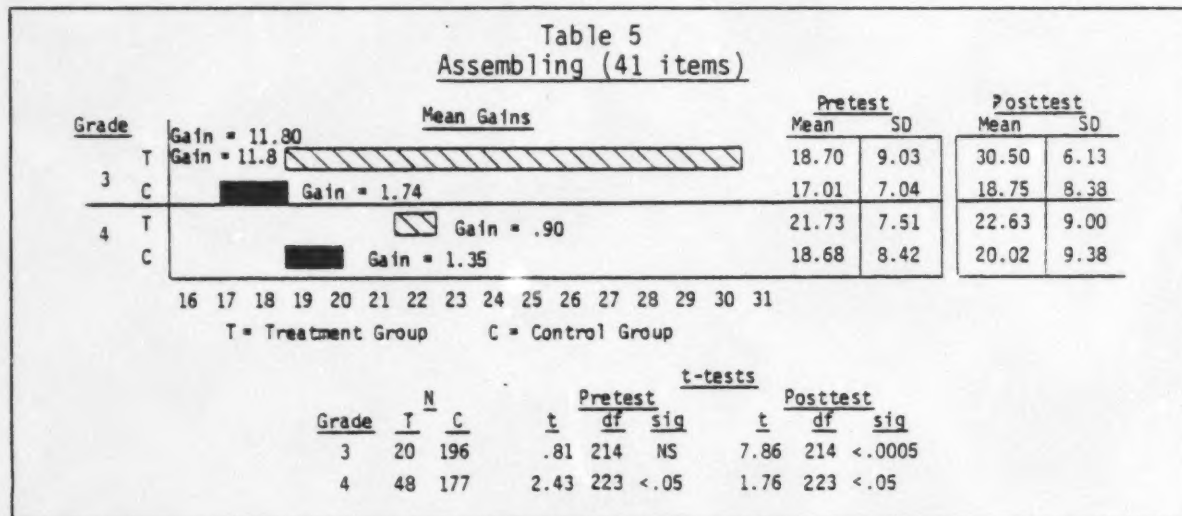
Grade		Mean Gains	Pretest		Posttest	
			Mean	SD	Mean	SD
3	T	Gain = 11.80 	18.04	7.33	29.73	8.82
	C	Gain = 1.74 	17.01	7.04	18.75	8.38
4	T	Gain = 9.10 	17.38	5.92	26.48	7.03
	C	Gain = 1.35 	18.68	8.42	20.02	9.38

17 18 19 20 21 22 23 24 25 26 27 28 29 30

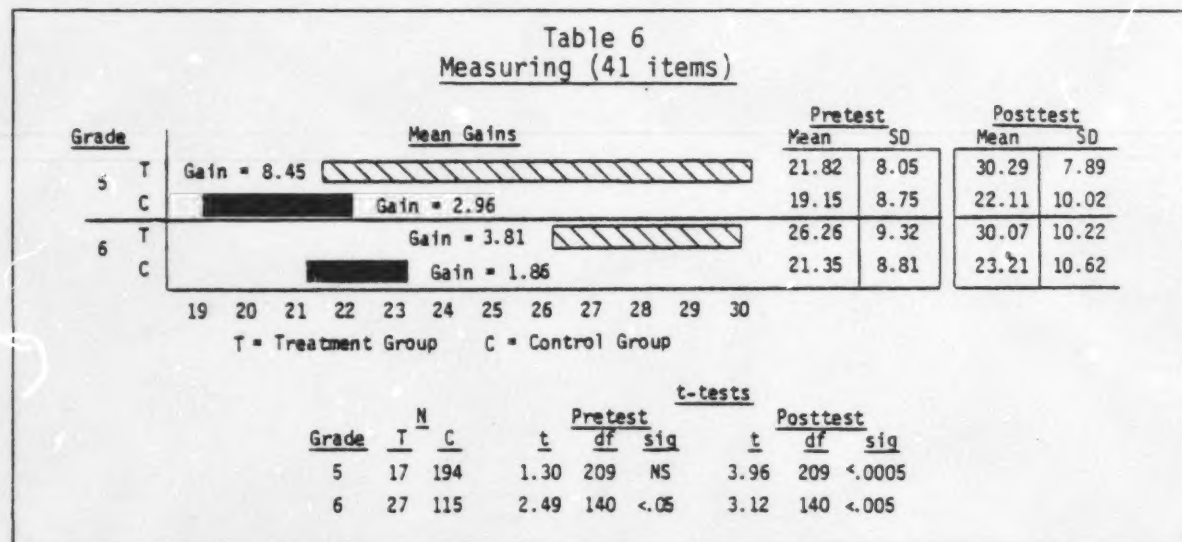
T = Treatment Group C = Control Group

t-tests								
Grade	N		Pretest			Posttest		
	T	C	t	df	sig	t	df	sig
3	49	196	.89	243	NS	7.87	243	<.0005
4	21	177	.90	196	NS	3.82	196	<.0005

Occupation Simulation Packet: Assembling (Table 5). This activity was highly effective at the third grade but not effective at the fourth grade, as shown in Table 5.

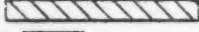


Occupation Simulation Packet: Measuring (Table 6). This activity worked well at the fifth grade, as shown in Table 6. While the sixth grade treatment group gained more than the control, the difference was inconclusive due to the significant difference in pretest scores.



Yellow, Blue, and Red Book (Table 7). At all five grade levels tested, the treatment group achieved significantly higher posttest scores than the control as shown in Table 7. At grade 3, the pretest score difference was also significant; however, the posttest score difference was much larger.

Table 7
Yellow, Blue, and Red Book (26 items at Grade 1, 41 items at grades 3-6)

Grade		Mean Gains	Pretest		Posttest	
			Mean	SD	Mean	SD
1	T	 Gain = 7.33	13.67	6.50	21.00	4.86
	C	 Gain = .24	12.66	4.90	12.90	4.88
3	T	 Gain = 7.00	22.58	9.33	29.58	9.89
	C	 Gain = 1.74	17.01	7.04	18.75	8.38
4	T	 Gain = 12.79	18.09	6.83	30.88	9.29
	C	 Gain = 1.35	18.68	8.42	20.02	9.38
5	T	 Gain = 6.70	20.70	7.99	27.40	12.90
	C	 Gain = 2.96	19.15	8.75	22.11	10.02
6	T	 Gain = 6.75	20.89	10.20	27.64	10.71
	C	 Gain = 1.86	21.35	8.81	23.21	10.62

12 14 16 18 20 22 24 26 28 30 32
T = Treatment Group C = Control Group

Grade	N		t-tests			t-tests		
	T	C	t	df	sig	t	df	sig
1	6	166	.38	170	NS	4.01	170	<.0005
3	26	196	2.94	220	<.01	5.34	220	<.0005
4	33	177	.44	208	NS	6.15	208	<.0005
5	20	194	.82	212	NS	1.78	212	<.05
6	47	115	.27	160	NS	2.40	160	<.01

Many Thousand Words - Work Pictures (Table 8). As shown in Table 8, the treatment group outperformed the control group at grades 1, 3, 5, and 6. At grades 3 and 6, the pretest difference was also significant, but the gain in treatment group performance was larger. Growth at the fourth grade level is approximately equal for the two groups.

Table 8
Many Thousand Words - Work Pictures (26 items at grade 1, 41 items at grades 3-6)

Grade		Mean Gains	Pretest		Posttest	
			Mean	SD	Mean	SD
1	T	 Gain = 2.87	13.87	3.69	16.74	4.01
	C	 Gain = .24	12.66	4.90	12.90	4.88
3	T	 Gain = 5.16	21.04	7.66	26.20	8.42
	C	 Gain = 1.74	17.01	7.04	18.75	8.38
4	T	 Gain = 1.63	18.26	6.46	19.89	7.34
	C	 Gain = 1.35	18.68	8.42	20.03	9.38
5	T	 Gain = 6.22	19.52	7.68	25.74	10.19
	C	 Gain = 2.96	19.15	8.75	22.11	10.02
6	T	 Gain = 6.95	26.48	11.16	33.43	8.44
	C	 Gain = 1.86	21.35	8.81	23.21	10.62

12 14 16 18 20 22 24 26 28 30 32 34
T = Treatment Group C = Control Group

Grade	N		t-tests			t-tests		
	T	C	t	df	sig	t	df	sig
1	38	166	1.71	202	NS	5.10	202	<.0005
3	25	196	2.50	219	<.01	4.17	219	<.0005
4	19	177	.26	194	NS	.08	194	NS
5	73	194	.34	265	NS	2.61	265	<.01
6	23	115	2.08	136	<.01	5.06	136	<.005

Educational Significance of Results

In order to better display the amount of student growth after implementation of Project Equality materials, Table 9 has been constructed to show score gains for the treatment students in standard deviation terms. Each value in Table 9 represents the treatment students' score gain divided by the pre- or posttest standard deviation, whichever is larger. That is, each value is equal to:

$$\frac{\text{posttest } \bar{X} - \text{pretest } \bar{X}}{\text{SD}_{\text{larger}}}$$

The larger standard deviation was chosen so that the result would be the more conservative estimate of student gains.

As shown, six of the seven materials produced gains of over one standard deviation at one or more grade levels. Eighteen out of 20 gains were greater than one-third of a standard deviation. Gains of one-third standard deviation or more were obtained at every grade level that was tested. These results were obtained in the relatively short time of two to three weeks, using only one set or packet of materials. It is probable that use of more than one set of materials over a longer period would increase impact further.

Table 9
Ratio of Treatment Students' Gains to Larger Standard Deviation (Pre- or Posttest)

	<u>Grades</u>						
	<u>K</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Yellow, Red, & Blue Book		1.13		.71	1.38	.52	.63
Many Thousand Words		.72		.62	.22	.61	.63
Color Discrimination			1.12				
Crawling & Squatting	.34	1.08	1.73				
Creativity				1.33	1.29		
Assembling				1.31	.10		
Measuring						1.05	.37

Generalizability

The evidence given above demonstrates that these materials are highly effective with populations such as those in the Northshore and Bellevue School Districts. These populations are mainly white and middle class. It is worth noting that all materials, especially those for direct use with students, are unusually attractive and present simple, intriguing activities which make use of skills most students already have regardless of their achievement levels.

Conclusion

Washington State law and national Title IX legislation both speak to decreasing sex discrimination in all aspects of the education system. In recent studies it has been found that schools, for the most part, are not fully demonstrating the past, present, or future participation of females in a variety of work roles in textbooks, audio-visual materials, career education programs and teaching strategies. Across the country educators are attempting to develop and acquire media and materials which present females and males in non-stereotyped occupational and personal roles. The materials outlined in these objectives fit this requirement, and have been tested in an experimental atmosphere and found to be effective. Project Equality's contributions are a positive step in the direction of improved student self-concept, which can serve to benefit all students and the educational system in which they function.